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QUANTIFICATION OF HUNGRY HORSE RESERVOIR WATER LEVELS NEEDED TO MAINTAIN OR ENHANCE RESERVOIR FISHERIES
APPENDICES

Annual Report
1986

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Project 83-465
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June 1987

Appendix B1. Continued, Murry Area 1985.

Month	Number of Samples	Daphnia Pulex	Daphnia Non-pulex	Bosmina	Leptodora	Total Cladocerans	Diaptomus	Cyclops	Epischura	Total Copepods	Total Zooplankton
						Number					
May	9	2(<1)	11(<1)	41 (1)	0 (0)	54 (2)	1593(54)	1317(44)	3(<1)	2913(98)	2967
June	12	51 (1)	235 (4)	413 (7)	0 (0)	699(12)	2555(43)	2693(45)	14(<1)	5262(88)	5961
July	15	639 (4)	1823(12)	6871(44)	0 (0)	9333(59)	2804(18)	3549(23)	17(<1)	6370(41)	15703
August	12	665 (7)	2431(25)	1281(13)	0 (0)	4377(45)	2213(23)	3183(33)	16(<1)	5417(55)	9794
September	12	745 (9)	2004(24)	265 (3)	0 (0)	3014(37)	1396(17)	3769(46)	8(<1)	5173(63)	8187
October	15	593 (9)	1583(24)	151 (2)	0 (0)	2326(36)	1574(24)	2557(40)	4(<1)	4135(64)	6462
November	6	419(10)	682(16)	202 (5)	0 (0)	1302(31)	1039(25)	1830(44)	2(<1)	2871(69)	4173
Year	81	476 (6)	1375(17)	1610(19)	0(<1)	3461(42)	1978(24)	2842(34)	10(<1)	4829(58)	8290
						Weight					
May	9	0.6(<1)	0.4(<1)	0.7 (1)	0 (0)	1.7 (2)	55.7(56)	42.6(43)	0.2(<1)	98.5(98)	100.2
June	12	4.9 (3)	8.4 (4)	4.0 (2)	0 (0)	17.3 (9)	106.6(56)	64.6(33)	1.8 (1)	173.0(91)	190.3
July	15	89.8(19)	123.2(26)	43.9 (9)	0 (0)	256.9(54)	114.3(24)	97.5(21)	4.2 (1)	216.0(46)	472.9
August	12	113.4(19)	297.2(51)	16.8 (3)	0 (0)	427.4(73)	66.2(11)	84.6(15)	3.9(<1)	154.7(27)	582.1
September	12	134.9(31)	171.9(40)	3.6(<1)	0 (0)	310.4(72)	31.5 (7)	91.4(21)	2.5(<1)	123.0(28)	433.4
October	15	112.9(40)	101.9(35)	1.5(<1)	0 (0)	216.4(75)	33.3(11)	40.6(14)	1.1(<1)	73.9(25)	290.4
November	6	71.2(38)	52.8(28)	2.2 (1)	0 (0)	126.3(68)	31.1(17)	28.4(15)	1((<1)	59.5(32)	185.9
Year	81	80.3(23)	116.4(34)	12.2 (4)	0 (0)	209.1(61)	66.0(19)	63.0(20)	2.1(<1)	135.8(40)	344.9

Appendix B1. Continued, Sullivan Area 1985.

Month	Number of Samples	Daphnia Pulex	Daphnia Non-pulex	Bosmina	Leptodora	Total Cladocerans	Diaptomus	Cyclops	Epischura	Total Copepods	Total Zooplankton
						Number					
May	4	1(<1)	0 (0)	4 (1)	0 (0)	5 (1)	99(27)	264(72)	0 (0)	363(99)	368
June	6	13 (1)	98 (5)	175 (9)	0 (0)	286(15)	1087(56)	556(29)	4(<1)	1647(85)	1933
July	7	166 (2)	1286(17)	2450(33)	0 (0)	3902(53)	2079(28)	1381(19)	39(<1)	3499(47)	7401
August	6	236 (3)	1604(17)	2005(21)	0 (0)	3845(41)	3295(35)	2239(24)	28(<1)	5562(59)	9407
September	6	298 (6)	888(19)	323 (7)	<1(<1)	1510(32)	454(10)	2729(58)	19 (4)	3202(68)	4712
October	6	721 (9)	2040(25)	446 (5)	0 (0)	3207(39)	742 (9)	4228(52)	10(<1)	4980(61)	8187
November	2	538 (5)	1282(12)	519 (5)	0 (0)	2339(23)	2707(26)	5347(51)	<1(<1)	8054(77)	10393
Year	37	266 (4)	1064(18)	970(16)	<1 (0)	2300(39)	1455(25)	2160(36)	12 (2)	3627(61)	5928
						Weight					
May	4	0.1(<1)	0 (0)	0.1(<1)	0 (0)	0.2 (1)	4.5(31)	9.7(67)	0 (0)	14.2(99)	14.4
June	6	1.2 (2)	2.4 (4)	1.8 (3)	0 (0)	5.4(10)	38.4(70)	10.6(19)	0.5 (1)	49.5(90)	54.9
July	7	20.9 (7)	93.9(33)	26.2 (9)	0 (0)	141.0(50)	96.5(67)	42.3(15)	4.7 (2)	143.5(50)	284.5
August	6	45.9(10)	155.5(34)	18.0 (4)	0 (0)	219.4(48)	82.5(18)	54.7(12)	101.1(22)	238.3(52)	457.7
September	6	52.2(28)	85.8(46)	2.2(<1)	0 (0)	140.4(75)	7.1 (4)	39.3(21)	5.9 (3)	46.4(25)	186.9
October	6	97.8(33)	113.8(39)	4.0(<1)	0 (0)	215.6(73)	17.1 (6)	62.4(21)	2.9 (0)	79.6(27)	295.2
November	2	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0
Year	37	35.9(17)	75.7(35)	9.2(<1)	0 (0)	120.9(56)	42.2(19)	36.1(17)	12.1 (6)	95.7(44)	216.7

Appendix B1. Continued, Areas combined 1985. M = Mean, P = percent, Standard deviations are in parenthesis.

Month	Number of Samples	Daphnia Pulex M	P	Daphnia Non-pulex M	P	Bosmina M	P	Leptodora M	P	Total Cladocerans M	P	Diaptomus M	P	Cyclops M	P	Epischura M	P	Total Copepods M	P	Total Zooplankton
										Number										
May	19	8 (19)	<1	22 (37)	<1	51 (58)	1	0	0	81 (103)	2	1879 (1825)	52	1654 (1505)	46	1405 (3)	39	3534 (3130)	98	3615 (3139)
June	24	68 (88)	1	265 (248)	5	427 (450)	8	0	0	760 (739)	14	2378 (1269)	44	2282 (1315)	42	11 (13)	<1	4671 (2521)	86	5431 (3109)
July	28	518 (422)	4	1815 (320)	13	5291 (4539)	38	<1	0	7624 (5451)	55	2794 (1101)	20	3353 (1623)	24	14 (12)	<1	6161 (2529)	45	13780 (7096)
August	24	454 (383)	5	2287 (636)	25	1214 (1495)	13	<1	0	3956 (1567)	43	2290 (1616)	25	2936 (745)	32	19 (9)	<1	5244 (1770)	57	9200 (3043)
September	23	558 (330)	8	1800 (851)	24	294 (167)	4	<1	0	2651 (1101)	36	1157 (602)	16	3549 (1365)	48	10 (7)	<1	4717 (1799)	64	7368 (2750)
October	27	554 (330)	8	1611 (740)	23	248 (162)	4	0	0	2412 (966)	35	1334 (717)	19	3215 (1184)	46	5 (6)	<1	4553 (1211)	65	6965 (1910)
November	11	364 (324)	7	711 (345)	14	233 (183)	5	0	0	1309 (745)	27	1228 (1055)	25	2377 (1504)	48	1 (1)	<1	3606 (2424)	73	4915 (3010)
Year	156	378 (376)	5	1315 (1016)	17	1311 (2752)	17	<1	<1	3004 (3478)	38	1937 (1344)	25	2853 (1446)	37	10 (11)	<1	4799 (2328)	62	7804 (5056)
										Weight										
May	19	<1 (<1)	<1	<1 (<1)	<1	<1 (<1)	<1	0	0	2.2 (3)	2	64.2 (75.2)	53	53.9 (51)	47	<1 (<1)	<1	118.3 (117.2)	98	120.6 (118.5)
June	24	6.1 (7.8)	3	8.6 (8.6)	5	3.9 (4.1)	2	0	0	18.7 (19.0)	10	103.5 (73.9)	58	55.6 (32.5)	31	1.3 (1.6)	<1	160.4 (100.6)	90	179.2 (115.1)
July	28	66.2 (71.3)	14	136.0 (91.5)	28	57.5 (61.6)	12	0	0	259.8 (173.8)	53	120.8 (51.3)	25	105.2 (75.4)	22	2.8 (2.4)	<1	228.8 (119.7)	47	488.7 (257.1)
August	24	74.4 (73.0)	14	269.2 (183.5)	52	13.8 (18.6)	3	0	0	357.4 (189)	69	62.6 (39.9)	12	75.1 (21.7)	15	19.2 (44.2)	4	157.0 (53.1)	31	514.4 (170)
September	23	93.9 (68)	25	171.9 (115.2)	47	3.3 (2.2)	<1	0	0	269.2 (130.6)	73	23.8 (14.2)	6	72.9 (42.6)	20	3.2 (2.3)	<1	100.0 (52.3)	27	369.2 (165.1)
October	27	92.1 (62.8)	33	96.9 (50.4)	35	2.5 (1.6)	<1	0	0	191.6 (89.6)	69	28.3 (15.2)	10	54.8 (24.7)	20	1.3 (1.7)	<1	84.5 (24.8)	31	276.1 (88.2)
November	11	43.3 (58.4)	34	36.5 (26)	29	1.6 (1.2)	1	0	0	81.5 (76.5)	65	21.4 (15.6)	17	22.3 (11.6)	18	<1 (<1)	<1	44.0 (26.4)	35	125.6 (100.5)
Year	156	57.2 (67.1)	18	112.0 (130)	35	14.2 (33.8)	4	0	0	183.4 (174.8)	57	65.0 (60.5)	20	67.3 (48.7)	21	4.4 (18.2)	1	136.8 (97.7)	43	320.2 (218)

Appendix 32. Continued, Murray Area, 1986.

Month	Number of Samples	Daphnia Pulex	Daphnia Non-pulex	Bosmina	Leptodora	Total Cladocerans	Diaptomus	Cyclops	Epischura	Total Copepods	Total Zooplankton
						Number					
April	3	32	158	36	0	226	2853	1618	0	4471	4696
May	6	33	596	61	0	690	4010	2074	2	6086	6776
June	5	177	1342	151	0	1670	6872	2167	53	9103	10770
July	6	395	2343	2032	<1	4770	2880	4035	8	6942	11710
August	6	326	2245	3504	<1	6076	405	4515	25	5047	11120
September	6	422	1508	1082	<1	3013	717	4725	7	5449	8462
October	6	294	1240	320	<1	1854	910	4915	7	5832	7686
November	6	301	749	129	0	1179	1651	3271	1	4923	6102
December	3	172	322	41	0	535	1688	2200	1	3889	4424
Year	47	258	1282	931	<1	2471	2371	3494	13	5878	8349
						Weight					
April	3	7.1	10.2	0.9	0	18.2	123.7	70.3	0.0	194.0	212.2
May	6	6.1	32.7	1.1	0	39.9	90.8	64.8	0.1	155.6	195.5
June	5	25.2	69.3	1.5	0	96.0	253.6	73.9	8.7	336.3	432.3
July	6	38.0	240.8	18.5	0	297.2	80.5	140.7	2.7	223.9	521.1
August	6	55.8	260.2	40.3	0	356.2	12.7	126.4	8.4	147.4	503.6
September	6	85.2	158.1	12.9	0	256.2	21.6	97.4	2.2	121.1	377.3
October	6	56.3	161.1	3.6	0	221.0	35.5	97.0	1.9	134.4	355.5
November	6	67.7	95.8	1.6	0	165.1	44.6	75.5	0.3	120.4	285.4
December	3	44.9	42.1	0.6	0	87.6	45.6	46.0	0.3	92.0	179.6
Year	47	45.4	131.8	10.2	0	187.5	74.3	92.1	2.9	169.3	356.8

Appendix B2. Continued, Sullivan Area, 1986.

Month	Number of Samples	Daphnia Pulex	Daphnia Non-pulex	Bosmina	Leptodora	Total Cladocerans	Diaptomus	Cyclops	Epischura	Total Copepods	Total Zooplankton
						Number					
April	3	5	13	14	0	32	954	579	0	1533	1565
May	6	<1	2	1	0	3	281	64	23	368	372
June	5	12	49	59	0	119	1140	67	85	1291	1411
July	5	62	555	835	0	1452	1344	605	5	1954	3406
August	6	122	2095	3425	2	5643	506	1833	35	2374	8017
September	6	113	1544	1677	1	3335	495	2375	9	2878	6213
October	6	169	1081	462	0	1712	1076	3562	9	4647	6359
November	6	442	908	162	0	1513	3136	5457	4	8597	10100
December	3	543	1053	80	0	1677	7752	3211	5	10960	12640
Year	46	154	869	850	<1	1874	1554	2054	20	3629	5503
						Weight					
April	3	1.9	0.9	0.3	0	3.1	47.9	21.8	0.0	69.8	72.9
May	6	0	0.1	<0.1	0	0.1	17.0	2.5	0.6	20.1	20.2
June	5	1.5	2.3	0.5	0	4.4	66.6	2.3	7.3	76.1	80.5
July	5	7.1	28.1	8.1	0	43.2	31.6	25.2	0.8	57.6	100.8
August	6	19.1	108.8	30.0	0	157.8	18.8	59.7	5.8	84.4	242.2
September	6	16.8	204.9	19.5	0	241.2	24.6	55.4	2.8	82.7	324.0
October	6	27.4	153.3	4.8	0	185.5	57.3	81.2	2.9	141.4	326.9
November	6	62.9	84.5	2.3	0	149.7	138.9	125.7	1.1	265.7	415.4
December	3	80.7	125.4	1.0	0	207.1	287.3	73.8	1.3	362.4	569.4
Year	46	22.8	83.5	8.4	0	114.7	66.0	51.6	2.7	120.2	234.9

Appendix B2. Continued, Areas Combined, 1986. M=mean, P=percent, standard deviations are in parentheses.

Month	Number of Samples	Daphnia Pulex M	P	Daphnia Non-pulex M	P	Bosmina M	P	Leptodora M	P	Total Cladocerans M	P	Diaptomus M	P	Cyclops M	P	Epischura M	P	Total Copepods M	P	Total Zooplankton
										Number										
April	6	19	<1	85	3	25	1	0	0	129	4	1903	61	1098	35	0	0	3002	96	3131
May	21	90	2	448	10	56	1	0	0	594	14	2372	55	1332	31	7	1	3711	86	4305
June	15	454	5	2103	22	326	3	0	0	2883	30	5040	53	1503	16	66	1	6610	70	9493
July	17	458	5	2157	22	1803	18	<1	<1	4418	45	2110	21	3294	33	7	1	5411	55	9829
August	17	197	2	1959	19	3708	35	<1	<1	5865	56	443	4	4209	40	30	<1	4683	44	10540
September	17	234	3	1690	19	1433	16	<1	<1	3358	38	782	9	4658	53	9	<1	5449	62	8808
October	18	257	3	1264	15	405	5	<1	<1	1926	23	939	11	5655	66	7	<1	6501	77	8528
November	17	340	4	770	10	146	2	0	0	1257	16	2038	26	4542	58	2	<1	6582	84	7839
December	9	310	4	556	7	62	1	0	0	928	12	3609	47	3096	41	2	<1	6708	88	7636
Year	137	271 (349)	4	1321 (1281)	16	982 (1442)	12	<1 (<1)	<1	2575 (2495)	32	2026 (2326)	25	3436 (2422)	43	16 (31)	<1	5477 (3136)	63	8053 (4549)
										Weight										
April	6	4.5	3	5.5	4	0.6	1	0	0	10.6	7	85.8	60	46.0	32	0.0	0	131.9	93	142.5
May	21	11.1	7	22.1	14	1.0	<1	0	0	34.2	21	82.0	51	44.6	28	0.2	<1	126.8	79	161.0
June	15	62.8	16	104.6	26	4.6	1	0	0	172.0	43	174.4	44	49.7	12	6.0	1	230.2	57	402.2
July	17	50.7	13	156.8	41	18.1	5	0	0	225.5	59	61.9	16	94.2	25	1.9	<1	157.9	41	383.5
August	17	33.4	9	166.1	45	38.8	11	0	0	238.3	65	14.9	4	107.3	29	6.1	2	128.3	35	366.6
September	17	44.2	11	201.9	51	15.9	4	0	0	262.0	66	33.8	9	96.1	24	2.6	1	132.6	34	394.6
October	18	45.3	12	167.9	46	5.0	1	0	0	217.7	59	41.3	11	107.6	29	2.1	1	151.0	41	369.7
November	17	58.2	19	76.5	24	2.1	1	0	0	136.8	44	74.1	24	100.5	32	0.6	<1	175.2	56	312.0
December	9	53.7	17	68.5	22	0.9	<1	0	0	123.1	39	124.1	40	65.8	21	0.6	<1	191.5	61	314.7
Year	137	41.4 (49.8)	13	116.3 (107.1)	36	10.6 (15.4)	3	0 (0)	0	168.3 (145.0)	52	71.9 (80.4)	22	82.2 (47.7)	25	2.4 (3.4)	1	156.5 (94.3)	48	324.8 (199.2)

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